

Built to Move: School Environments Promoting Physical Activity and Obesity Prevention

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Introduction

Childhood obesity is a growing global health issue, linked to long-term physical and mental health problems such as heart disease, diabetes, and orthopedic disorders [1, 2]. Without early intervention, obesity often persists into adulthood, emphasizing the need for preventive action starting in childhood [3]. While obesity is influenced by multiple factors, promoting physical activity (PA) is key, especially through school environments that support active behavior [4, 5]. Recent strategies include sustainable school and urban design approaches that encourage movement both during the school day and through active commuting [6].

This study reviews how such design interventions can promote PA and help reduce childhood obesity, focusing on children aged 9 and older who commute independently. It highlights successful strategies and offers recommendations for future research and policy.

Materials and Methods

This study employed a systematic literature review following PRISMA guidelines to examine how school-related design strategies and transport routes support physical activity (PA) and reduce obesity in children aged 9 and older. Using SCOPUS, a targeted keyword search was conducted.

The review focused on identifying environmental factors, barriers, and innovative interventions that promote active school travel and PA within school complexes. Key themes were categorized into two dimensions: active commuting routes and school infrastructure.

Results and Discussion

PRISMA Screening Results

A systematic search using PRISMA identified 2,612 records. After screening based on language (English), subject relevance (e.g., Environmental Science, Engineering), and publication type, 95 full-text papers were retained.

Following eligibility checks, 64 were excluded, and 9 added from references, resulting in 40 final studies (see *Figure 1* for PRISMA flowchart).

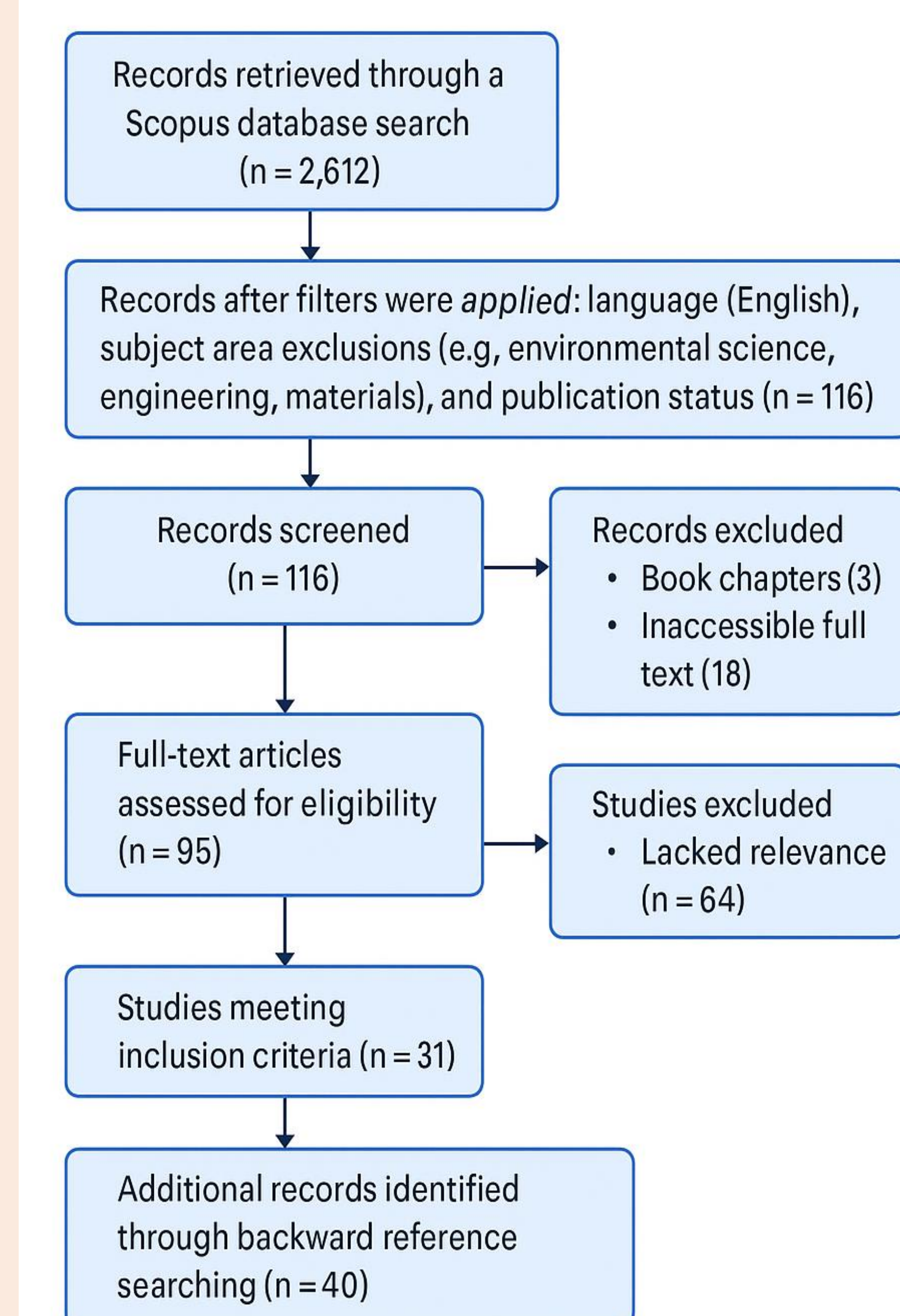


Figure 1: Prisma Flowchart

Built Environment and Active School Travel

Built environments surrounding schools significantly influence children's physical activity (PA) and body mass index (BMI).

Safe, well-connected pedestrian and cycling routes-with elements such as sidewalks, mixed land use, and low traffic speeds-support active commuting, which correlates with increased daily PA and lower obesity risks.

However, these benefits are moderated by factors like food environments and socioeconomic conditions.

Urban planning must consider residential density, school proximity, and parental perceptions of safety to effectively promote active school travel.

School Design and Activity Opportunities

The physical layout and facilities within school complexes can encourage higher levels of PA.

Features like large, multifunctional schoolyards, nature trails, varied play zones, and both competitive and non-competitive activity spaces promote inclusive exercise. Weather-protected areas, redesigned stairwells, and shared-use community spaces enhance accessibility and year-round activity.

Involving students, parents, and communities in school design ensures relevance and sustainability of these interventions.

Limitations and Need for Local Adaptation

Effective strategies must adapt to cultural, economic, and geographic contexts, and reflect the needs of diverse groups.

While active commuting may not fully prevent obesity, it encourages lifelong physical activity. More integrated research is needed to better understand how built environments impact PA and BMI.

Conclusion

This review highlights that while school-related built environment interventions—such as active school routes and well-designed schoolyards—can support increased physical activity in children, their overall effectiveness in preventing overweight and obesity remains limited due to gaps in integrated research. Most studies do not simultaneously assess built environment features, PA levels, and BMI, and few focus on the role of families or younger children. Future strategies should be context-specific and inclusive, involving diverse communities in planning, and promoting active design features both within schools and their surrounding neighborhoods. More comprehensive, global research is needed to guide effective policy and practice.

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